

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 01-236657

(43)Date of publication of application : 21.09.1989

(51)Int.CI. H01L 29/80  
H01L 27/08

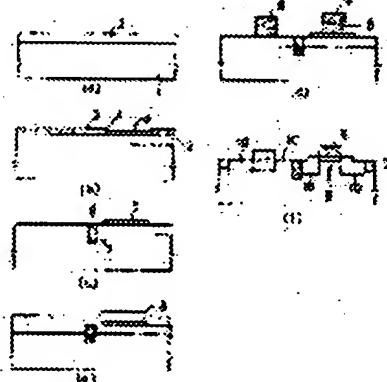
(21)Application number : 63-064041 (71)Applicant : TOSHIBA CORP  
(22)Date of filing : 17.03.1988 (72)Inventor : IWASAKI HIROSHI

## (54) SEMICONDUCTOR DEVICE AND MANUFACTURE THEREOF

### (57)Abstract:

**PURPOSE:** To make it possible to form MESFETs whose threshold voltages are different from each other, on the same substrate by a method wherein step differences are provided on the surface of a semiconductor film by further laminating it with a part of a layer to become a channel active layer by a crystal growth technique which performs control at the level of an atomic layer on an epitaxial active layer which is controlled and deposited at the level of an atomic layer.

**CONSTITUTION:** An N-type GaAs epitaxial layer 2 is formed on a semi-insulative GaAs substrate 1 by a technique of superposing atomic planes one sheet by one sheet and a prescribed part only of an epitaxial layer 5 of the level of an atomic layer is further deposited on the layer 2 using this crystal growth technique. Then, a high-melting point metal film or a high-melting point metal compound film 8 is formed as a gate electrode, an insulating film 9 is deposited thereon to perform a gate electrode processing and the electrode 8 is self-aligned to form source/drain N+ layers 10 by implanting Si ions. Thereby, MESFETs(Metal Semiconductor Field Effect Transistors), whose threshold voltages are different from each other, can be manufactured on the same substrate.



### LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]